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6.3 Showers, Faucets, and Drinking Fountains

According to the water efficiency plumbing standards of the Energy Policy Act of 1992, new showerheads and faucets must have a maximum flow rate of 2.5 gallons per minute (gpm) at 80 psi (9.5 liters per minute at 550 kPa). Many new products are available (at widely varying prices) to achieve this reduced flow rate. Although drinking fountains are not regulated by the government, they should be included in water management programs.

Opportunities

It is becoming common for showers to be installed in office buildings, reflecting the trend toward healthier life-styles, commuting by bicycle or foot, and exercise programs. Military and national park housing, of course, contains large numbers of showers and faucets. There are many shower and faucet retrofits for achieving (or exceeding) the water conservation standards that provide rapid payback. The fact that water-efficient showerheads and faucets also save energy (by reducing hot water use) makes them attractive *energy* retrofit options as well.

Technical Information

Equipment selection and water conservation retrofit options for showers, faucets, and drinking fountains are as follows:

SHOWERS

A conventional showerhead is rated to use 3 to 7 gallons (11 to 27 liters) per minute at normal water pressure, about 80 psi (550 kPa). A 5-minute shower with a conventional showerhead typically consumes 15 to 35 gallons (60 to 130 liters) of water.

High-quality replacement showerheads that deliver 1.0 to 2.5 gallons (3.8 to 9.5 liters) per minute can save many gallons per shower when used to replace conventional showerheads. Products vary in price from $3 to $95—and many good models are available for $10 to $20. A variety of spray patterns are available, ranging from misty to pounding and massaging. They typically have narrower spray jets and a greater mix of air and water than conventional showerheads, enabling them to provide what feels like a full-volume shower while using far less water. Facility managers should consult *Consumer Reports* or other objective comparisons of different models before making large purchases.

Flow regulators on the shower controls and temporary cutoff buttons or levers incorporated into the showerhead reduce or stop water flow when the individual is soaping or shampooing, further lowering water use. When the water flow is reactivated, it emerges at the same temperature, eliminating the need to remix the hot and cold water.

Flow restrictors are washer-like disks that fit inside showerheads, and they are tempting retrofits. However, flow restrictors provide poor water pressure in most showerheads. Flow-restrictor disks were given away by many water conservation programs, leading to poor acceptance of water conservation in general. Permanent water savings are better provided through the installation of well-engineered showerheads.

$ The actual amount of water savings from showerhead retrofits is difficult to establish because savings tests are often performed at full flow, while users often do not operate showers at maximum flow. There is also a high variability in shower length.

FAUCETS

Federal facilities deal with three kinds of faucets: bathroom (residential or institutional), kitchen (residential or institutional), and industrial/workroom. Flow rates and operation of these three types of faucets differ. Bathrooms need no more than 1.5 gallons (5.7 liters) per minute, for example, while residential kitchens rarely need less than 2.5 gallons (9.5 liters) per minute. Institutional bathroom faucets may include automated controls and premixed temperatures. Institutional kitchen faucets may include special features such as swivel-heads and foot-activated on/off controls.

Older faucets with flow rates of 3 to 5 gallons (11 to 19 liters) per minute waste tremendous quantities of water. Federal guidelines mandate that all lavatory and kitchen faucets and replacement faucet tips (including aerators) manufactured after January 1, 1994, consume no more than 2.5 gallons (9.5 liters) per minute at 80 psi (550 kPa). Metered-valve faucets are restricted to a 0.25-gallon (0.95 liters) per cycle discharge after this date.

Variations in water pressure are problematic for water management programs. Pressure-compensating

Photo: Pedal Valves, Inc.

By making it easy to run water only when it is actually being used, foot-pedal controllers save a surprising amount of water and energy.

faucets can be used to automatically maintain 2.5 gallons (9.5 liters) per minute at varying water pressures.

With manual-valve faucets, replacing the screw-in tip of the faucet is all that is usually necessary to reduce water use. While faucet aerators that mix air into the water stream are commonly used in residential faucets, they are specifically prohibited in health facilities because they can harbor germs and pathogens. Use nonaerating, low-flow faucet tips (including those providing a smooth, laminar stream of water). These devices are inexpensive. Choose 2.2- to 2.5- gpm (8.3- to 9.5-liter) devices for kitchens. In washrooms, 0.5- to 1.25-gpm (1.9- to 4.7-liter) models will often prove adequate for personal washing purposes.

Metered-valve faucets deliver a preset amount of water and then shut off. For water management purposes, the preset amount of water can be reduced by adjusting the flow valve. The Americans with Disabilities Act requires a 10-second minimum on-cycle time.

Foot controls for kitchen faucets provide both water savings and hands-free convenience. The hot-water mix is set and the foot value turns the water on and off at the set temperature.

Hot-water recirculation systems reduce water wasted while users wait for water to warm up as it flows from the faucet. To prevent these water-saving systems from wasting large amounts of energy, hot-water pipes should be well-insulated.

Electronic faucet controls are discussed in *Section 6.4 – Electronic Controls for Plumbing Fixtures*. To maximize water savings, choose the lowest-water-use models—typically 0.5 gpm (1.9 liters per minute).

☑ Repair leaky faucets: Institute a regular maintenance program to ensure that leaky faucets are regularly inspected and immediately repaired. A single leaky faucet (one drip per second) will waste 8.6 gallons (33 liters) of water per day. The thinnest stream of water running continuously will waste 43 gallons (160 liters) per day.

DRINKING FOUNTAINS

Self-contained drinking fountains have an internal refrigeration system. Adjusting the exit water temperature to 70°F (21°C) versus the typical 65°F (18°C) will result in substantial energy savings. Insulate the piping, chiller, and storage tank to save energy. If appropriate, add an automatic timer to shut off the unit during evenings and weekends.

Remote chillers or central systems are used in some facilities to supply cold drinking water to multiple locations. To conserve energy, the temperature can be raised from 65°F to 70°F (18°C to 21°C); piping should be well insulated, and a timer can be used to turn off the unit when the building is unoccupied.

Metering faucets are priced at $100 to $150. Sensor-operated metering faucets cost between $260 and $310. Sensor faucets require either electrical wiring for the connection of AC power or regular replacement of battery power supplies.

Contacts

American Water Works Association, 6666 W. Quincy Avenue, Denver, CO 80235; (800) 559-9855, (303) 794-6303 (fax); WaterWiser Web site: www.waterwiser.org.

Water Efficiency Program, Office of Wastewater Management (4204), U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460; (202) 260-7288 or (202) 260-7259; www.epa.gov/OWM/genwave.htm.